IN THE CLAIMS

Please CANCEL claims 175, 176 and 177, without prejudice or disclaimer.

Please AMEND the claims as indicated below:

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164. (CURRENTLY AMENDED) An apparatus comprising:

a multi-stage optical amplifier to amplify a wavelength division multiplexed (WDM) optical signal including a plurality of optical signals each of which has different wavelength, the plurality of optical signals being transmitted through associated signal channels, the multi-stage optical amplifier including

a first amplifier amplifying the WDM ~~a wavelength division multiplexed (WDM)~~ optical signal,

a dispersion compensator compensating dispersion given to the amplified WDM optical signal and outputting a dispersion compensated WDM optical signal, and

a second amplifier amplifying the dispersion compensated WDM optical signal, wherein channel spacing between a pair of adjacent signal channels is set to an integer multiple of a minimum channel spacing defined in terms of an optical frequency or an optical wavelength.

165. (PREVIOUSLY PRESENTED) An apparatus as in claim 164, wherein the first and second amplifiers are erbium doped optical fiber amplifiers.

166. (PREVIOUSLY PRESENTED) An apparatus as in claim 164, wherein the dispersion compensator is a dispersion compensation fiber.

167. (PREVIOUSLY PRESENTED) An apparatus as in claim 164, wherein the first and second amplifiers have a combined gain to output the dispersion compensated WDM optical from the second amplifier at a power level sufficient to be received by an apparatus downstream of the second amplifier.

168. (CURRENTLY AMENDED) An apparatus comprising:

a multi-stage optical amplifier to amplify a wavelength division multiplexed (WDM) optical signal including a plurality of optical signals each of which has different wavelength, the plurality of optical signals being transmitted through associated signal channels, the multi-stage optical amplifier including

a first amplifier amplifying the WDM ~~a wavelength division multiplexed (WDM)~~

optical signal,

a dispersion compensator providing dispersion compensation to the amplified WDM optical signal, and

a second amplifier amplifying the WDM optical signal provided with dispersion compensation by the dispersion compensator, wherein channel spacing between a pair of adjacent signal channels is set to an integer multiple of a minimum channel spacing defined in terms of an optical frequency or an optical wavelength.

169. (PREVIOUSLY PRESENTED) An apparatus as in claim 168, wherein the first and second amplifiers are erbium doped fiber amplifiers.

170. (PREVIOUSLY PRESENTED) An apparatus as in claim 168, wherein the first dispersion compensator is a dispersion compensation fiber.

171. (PREVIOUSLY PRESENTED) An apparatus as in claim 168, wherein the first and second amplifiers have a combined gain so that the WDM optical signal is output from the second amplifier at a power level sufficient to be received by an apparatus downstream of the second amplifier.

172. (CURRENTLY AMENDED) An apparatus comprising:

a multi-stage optical amplifier to amplify a wavelength division multiplexed (WDM) optical signal including a plurality of optical signals each of which has different wavelength, the plurality of optical signals being transmitted through associated signal channels, the multi-stage optical amplifier including

a dispersion compensator providing dispersion compensation to the WDMa ~~wavelength division multiplexed (WDM)~~ optical signal,

a first amplifier positioned upstream of the dispersion compensator, and

a second amplifier positioned downstream of the dispersion compensator, wherein

a combined gain of the first and second amplifiers is sufficient to compensate a loss in the dispersion compensator and to output the WDM optical signal from the second amplifier with an output power for transmission downstream of the second amplifier, and

channel spacing between a pair of adjacent signal channels is set to an

integer multiple of a minimum channel spacing defined in terms of an optical frequency or an optical wavelength.

173. (PREVIOUSLY PRESENTED) An apparatus as in claim 172, wherein the dispersion compensator is a dispersion compensation fiber.

174. (PREVIOUSLY PRESENTED) An apparatus as in claim 172, wherein the first and second amplifiers are erbium doped fiber amplifiers.

175. (CANCELED)

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178. (CURRENTLY AMENDED) An apparatus comprising:

a multi-stage optical amplifier to amplify a wavelength division multiplexed (WDM) optical signal including a plurality of optical signals each of which has different wavelength, the plurality of optical signals being transmitted through associated signal channels, the multi-stage optical amplifier including

a dispersion compensator providing dispersion compensation to ~~a~~ the plurality of optical signals, ~~each having a different wavelength,~~

a first amplifier positioned upstream of the dispersion compensator, and

a second amplifier positioned downstream of the dispersion compensator, wherein a combined gain of the first and second amplifiers is sufficient to compensate a loss in the dispersion compensator and to output the plurality of optical signals from the second amplifier at output power for transmission downstream of the second amplifier, wherein channel spacing between a pair of adjacent signal channels is set to an integer multiple of a minimum channel spacing defined in terms of an optical frequency or an optical wavelength.

179. (PREVIOUSLY PRESENTED) An apparatus as in claim 178, wherein the dispersion compensator is a dispersion compensation fiber.

180. (PREVIOUSLY PRESENTED) An apparatus as in claim 179, wherein the first and second

amplifiers are erbium doped fiber amplifiers.

181. (CURRENTLY AMENDED) An optical transmission system comprising:

a multiplexer wavelength-division-multiplexing a plurality of optical signals, each having a different wavelength and being transmitted thorough an associated signal channel, into a multiplexed optical signal, and outputting the multiplexed optical signal to an optical fiber;

a multi-stage optical amplifier, optically coupled to the optical fiber, including

a first amplifier amplifying the multiplexed optical signal from the optical fiber,

a dispersion compensator providing dispersion compensation to the amplified multiplexed optical signal to thereby output a dispersion compensated multiplexed optical signal, and

a second amplifier amplifying the dispersion compensated multiplexed optical signal to thereby output an amplified, dispersion compensated multiplexed optical signal; and

a demultiplexer wavelength-division-demultiplexing the amplified, dispersion compensated multiplexed optical signal into respective optical signals,

wherein channel spacing between a pair of adjacent signal channels is set to an integer multiple of a minimum channel spacing defined in terms of an optical frequency or an optical wavelength.

182. (PREVIOUSLY PRESENTED) An optical transmission system as in claim 181, wherein a combined gain of the first and second amplifiers is sufficient to compensate a loss in the dispersion compensator and to output the amplified, dispersion compensated multiplexed optical signal from the second amplifier at an output power for transmission downstream of the multi-stage optical amplifier.

183. (CURRENTLY AMENDED) An optical transmission system comprising:

an optical transmitter outputting a wavelength division multiplexed (WDM) optical signal to an optical fiber, the WDM optical signal including a plurality of optical signals transmitted through associated signal channels, each of the plurality of optical signals having different wavelength;

a multi-stage optical amplifier, optically coupled to the optical fiber, including

a first amplifier amplifying the WDM optical signal received from the optical fiber,

a dispersion compensator providing dispersion compensation to the amplified

WDM optical signal to thereby output a dispersion compensated WDM optical signal, and

a second amplifier amplifying the dispersion compensated WDM optical signal to thereby output an amplified, dispersion compensated WDM optical signal from the multi-stage optical amplifier; and

an optical receiver receiving the amplified, dispersion compensated WDM optical signal output from the multi-stage optical amplifier,

wherein channel spacing between a pair of adjacent signal channels is set to an integer multiple of a minimum channel spacing defined in terms of an optical frequency or an optical wavelength.

184. (PREVIOUSLY PRESENTED) An optical transmission system as in claim 183, wherein the first and second amplifiers have a combined gain so that the amplified, dispersion compensated WDM optical signal is output from the multi-stage optical amplifier at a power level sufficient to be received by the receiver.